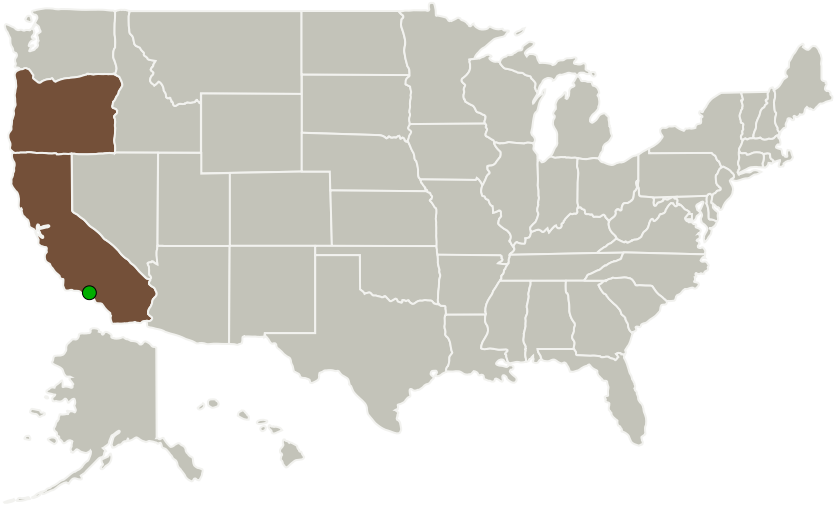
Titan Montgolfiere Terrestrial Test Bed, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

With the Titan Saturn System Mission, NASA is proposing to send a Montgolfiere balloon to probe the atmosphere of Titan. In order to better plan this mission and create a robust optimized balloon design, NASA requires the ability to more accurately evaluate the convective heat transfer characteristics of the balloon operating in Titan's atmosphere. Based on limitations and shortfalls of previous efforts, NASA has requested proposals for a test bed to support CFD validation. Near Space Corporation (NSC) proposes to develop an innovative Titan Montgolfiere Terrestrial Test Bed (TMTT) with an innovative integrated sensor and data collection system to provide the required validation. The balloon envelope design will leverage experience gained on past Titan prototypes, and incorporate a novel data acquisition system that will enable both direct and indirect measurements. A combination of embedded sensors and infrared imaging will be used to provide both local and global surface measurements. The embedded sensors will be used to calibrate the remote IR imaging, providing better visualizations with higher resolution and more accurate measurements. The ground work for the system will be provided with model experimentation in Phase I and followed by the development of a full-size test bed in Phase II.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
GSSL, Inc.	Lead Organization	Industry	Tillamook, Oregon
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Oregon

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137357)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

GSSL, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

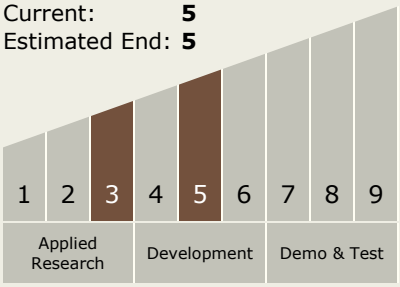
Carlos Torrez

Principal Investigator:

Timothy Lachenmeier

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
  - TX09.4 Vehicle Systems
    - TX09.4.4 Atmosphere and Surface Characterization

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System